on *Lumbricus*, Mrs. M. A. Bigelow on Olfactory nerves of Vertebrates, Dr. Neal on origin of motor nerves in Selachians, Dr. A. D. Morrill on histology of nervous system in planarians, Mr. Yerkes on physiology of pineal eye in lizards, Miss Marion Hubbard on the nervous system of *Dero*.

In Zoology: A monograph on *Arenicola cristata* is under way: The nephridia are being studied from the points of view of anatomy and embryology by Mr. R. S. Lillie, the spermatogenesis by Mr. E. R. Downing, Oögenesis by Mr. Arthur E. Hunt, Organs of circulation by Miss Emma Keith. The first part of this monograph, the embryology, by Dr. C. M. Child, is already published and other parts, including the ones mentioned, are well under way. The zoological studies not already mentioned include work on Coelenterata by Dr. Murbach, on *Hemiptera* by Mr. W. M. Chester, on *Pycnogonida* by Mr. L. J. Cole, on *Nemertea* by Miss C. B. Thompson, on *Pectinatella* by Miss A. W. Wilcox, on *Acmæa* by Miss M. A. Willcox, on *Amphipoda* by Dr. S. J. Holmes, on *Limulus* by Dr. Wm. Patten, on Lamellibranch gill by Dr. E. L. Rice, on *Annelids* by Dr. A. L. Treadwell.

In variation statistics and allied subjects, Miss M. M. Entemann on *Polistes*, Dr. E. C. Edwards on *Synapta*, Dr. H. E Crampton on Lepidoptera, Miss A. C. Dimon on snails.

In Botany: Cytological work has been carried on by Dr. B. M. Davis, Miss C. M. Derick, Dr. Walter Swingle.

Physiological work has been carried on by Dr. R. H. True and Mr. Roberts. Dr. George T. Moore and Dr. Erwin Smith have also been working in this department.

NOTES ON INORGANIC CHEMISTRY.

From the current chemical journals the following notes are taken:

Professor Fittica still persists in his claims of being able to change phosphorus into arsenic and antimony and gives PN_2O as the true formula of arsenic, and $P_2N_2O_2$ as that of antimony. Christomanos, preparing arsenic, according to Fittica's directions, from commercial phosphorus, tests it without success for the presence of phosphorus and nitrogen, but Fittica replies that this should not occasion surprise, since methods used for testing in one class of compounds often fail when applied to those in which the nitrogen is more firmly united.

The cause of the much discussed poisonous qualities of arsenical wall papers has been shown by Biginelli to be due to the evolution of a gas, diethyl arsin, formed under the influence of the mold *Pencillium brevicaule*, which thrives on arsenic, and develops on arsenical papers.

Some time since reference was made in these columns to the work of H. J. Möller on the protective value of different colored glasses for chemical and drug bottles. His former method was photo-chemical, but he now finds the use of the spectroscope equally satisfactory, and much simpler, a pocket spectroscope answering every purpose. Glasses have a protective value in proportion as they absorb the blue and violet light from the line F to the line H. Dark red glass is the best but most expensive; the dark olive-green of cheap bottles is very satisfactory; dark brown-yellow bottles are effective, but lighter shades of brown, green or blue have little value.

The claims of Desgrez and Balthazard for sodium peroxid as a regenerator of the air in submarine navigation have caused Jaubert to claim priority, as having been at work on the problem for more than three years. According to the latter, however, sodium peroxid has many disadvantages, but he expects in the near future to publish results attained with other substances which are more effective, and cheaper than even compressed oxygen.

It has been noticed at various times during the past four years that the water of the river Rhone exhibits certain reactions characteristic of aldehydes. This is found by Causse to be due to the presence of ferrous oxy-thio-carbonate $FeCO_2S$, which is formed by the combination of carbon dioxid with ferrous sulfid. The latter results from the reduction of sulfates by organic matter. The compound is broken up by distillation, or on standing, with the formation of an ocherous deposit.

The reduction of sulfates in water to hydrogen sulfid has been supposed to be due to the action of Beijerink's *Spirillum desulfuricans*,

but this is questioned by Saltet, who finds that different micro-organisms are concerned in the process, and that the reduction proceeds in stages, as is the case with the reduction of nitrates to ammonia. Saltet has isolated a new micro-organism, *Bacillus desulfuricans*, which reduces sulfates to sulfites, but produces no hydrogen sulfid.

IT has been found by Matignon that metallic magnesium liberates from their oxids not only thorium, cerium and lanthanum, but also praseodymium, neodymium and samarium. Nitrogen, but not argon, is rapidly absorbed by all of these metals. When the last three are obtained from their oxids in the presence of hydrogen, they unite with it to form hydrids, which are dissociated when strongly heated. Moissan finds that the carbid of samarium, SmC_2, can be formed in the electric furnace in minute, transparent, yellow, hexagonal crystals. It is decomposed by water, the chief gaseous product being acetylene, though considerable hydrogen and members of the paraffin series are also formed. In this action it closely resembles the carbid of yttrium.

THE fact that Dewar has found hydrogen to be a constituent of the atmosphere gives much interest to the discovery of Gautier, that hydrogen is formed by the action of water on granitic rocks at temperatures considerably below a red heat. In one experiment a granite rock was heated with phosphoric acid and gave 1,400 cc. of gas per kilo, 916 cc. of which was hydrogen. With water, the quantity liberated is somewhat less. Ammonia is formed at the same time, and Gautier concludes that both these gases are derived from the action of water on nitrids, chiefly iron nitrid, though possibly some of the hydrogen may come from carbides. Matteucci found during a recent eruption of Vesuvius, pieces of rock, coated with ammonium chlorid and iron nitrid, which would seem to show a close relation between these substances.

IN a short paper in the *Berichte*, Giesel confirms the observation of Walkhoff as to the effect of radio-active substances on the skin, similar to that of the Röntgen rays. He placed a celloloid capsule containing a quarter of a gram of radium, under his arm, and in two hours a slight reddening was apparent. In the course of two or three weeks considerable inflammation was present, with darkening, and finally loss of the skin. A similar action was found to take place on the leaves of living plants, and salts, glass and paper were also affected.

J. L. H.

ZOOLOGICAL NOTES.

DR. ANTONIO PORTA, of the Institute of Zoology and Comparative Anatomy at the University of Parma, has lately published in the Proceedings of the Royal Institute of Science and letters of Lombardy his researches on *Aphrophora spumaria* and, in a footnote, he says, "I had already finished the present paper when I received a pamphlet by Professor Morse in which he discusses the formation of the froth in the *Aphrophora spumaria*. It was with genuine satisfaction that I found there a confirmation of observations that I had made. Moreover, I repeated one of his excellent experiments, which leaves no doubt whatever of the fact that the insect emits a liquid only. Placing a larva on a piece of absorbent paper in order to dry it and then upon a glass, if we allow a drop of our saliva to fall upon it, it begins to fill this liquid with air-bubbles."

It is a curious fact that Mr. Morse gave an account of the manner in which the so-called spit-insect makes the froth on grass in his 'First Book of Zoology' twenty-five years ago. German editions appeared in Stuttgart and Berlin, an English edition was also published, and finally the book was translated into Japanese, and yet every general work on entomology has repeated the erroneous ideas regarding the habits of this creature. Even the last volume of the Cambridge Natural History series continues the error. In May of last year Mr. Morse published in the *Popular Science Monthly* an extended account with illustrations explaining more in detail the habits of the larva, and its method of forming the froth and it is to this paper that the Italian naturalist refers.

NOVA PERSEI.

PROFESSOR EDWIN B. FROST writes to the *Astronomical Journal* from Dartmouth College,